

Amendments of the Claims:

A detailed listing of all claims in the application is presented below. This listing of claims will replace all prior versions, and listings, of claims in the application. All claims being currently amended are submitted with markings to indicate the changes that have been made relative to immediate prior version of the claims. The changes in any amended claim are being shown by strikethrough (for deleted matter) or underlined (for added matter).

1. (Original): A transmission direction switching device for a half-duplex communication apparatus, said half-duplex communication apparatus including a universal asynchronous receiver transmitter (UART) and a half-duplex communication interface driver having a signal subtraction function and connected to said UART via a sending line and to said transmission direction switching device via a direction control line; said transmission direction switching device comprising:
 - a data transmission detector coupled to said sending line for detecting any data to be sent and sending said data if such data exists; and
 - a direction-switching rule executor for receiving said data sent out by said data transmission detector, and sending a direction switching signal via said direction control line to said half-duplex communication interface driver to set a transmission direction of said half-duplex communication interface driver to a sending direction when said data received from said data transmission detector is a signal 0 or a low signal, or sending a direction switching signal via said direction control line to said half-duplex communication interface driver to set a transmission direction of said half-duplex communication interface driver to a receiving direction when said data received from said data transmission detector is a signal 1 or a high signal.
2. (Original): 2. The transmission direction switching device as claimed in claim 1, wherein said half-duplex communication interface driver comprises a driver in compliance with RS485 standard.

3. (Original): 3. The transmission direction switching device as claimed in claim 1, wherein said transmission direction switching device is a programmable logic device.

4. (Original): 4. A transmission direction switching device for a half-duplex communication apparatus, said half-duplex communication apparatus including a universal asynchronous receiver transmitter (UART) and a half-duplex communication interface driver having a signal subtraction function and connected to said UART via a sending line and to said transmission direction switching device via a direction control line; said transmission direction

switching device comprising:

a data transmission detector coupled to said sending line for detecting any data to be sent and sending said data if such data exists; and

a direction-switching rule executor for receiving said data sent out by said data transmission detector and generating a negative data in reverse to said data received from said data transmission detector; and said direction-switching rule executor sending a direction switching signal via said direction control line to said half-duplex communication interface driver to set a transmission direction of said half-duplex communication interface driver to a sending direction when said negative data is a signal 0 or a low signal, or sending a direction switching signal via said direction control line to said half-duplex communication interface driver to set a transmission direction of said half-duplex communication interface driver to a receiving direction when said negative data is a signal 1 or a high signal.

5. (Original): claimed in claim 4, wherein said half-duplex communication interface driver comprises a driver in compliance with RS485 standard.

6. (Original): The transmission direction switching device as claimed in claim 4, wherein said transmission direction switching device is a programmable logic device.

7. (Original): A method for switching transmission direction of a half-duplex communication apparatus, said half-duplex communication apparatus including a universal asynchronous

receiver transmitter (UART), a half-duplex communication interface driver having a signal subtraction function, and a transmission direction switching device; said half-duplex communication interface driver being connected to said UART via a sending line and to said transmission direction switching device via a direction control line; and said transmission direction switching device including a data transmission detector and a direction-switching rule executor; said method comprising the steps of:

detecting any data transmission by using said data transmission detector coupled to said sending line to detect any data to be sent and sending said data

if such data exists; and

implementing transmission direction switching by using said direction-switching rule executor to receive said data sent by said data transmission detector, such that said direction-switching rule executor sends a direction switching signal via said direction control line to said half-duplex communication interface driver to set a transmission direction of said half-duplex communication interface driver to a sending direction when said data received from said data transmission detector is a signal 0 or a low signal, or sends a direction switching signal via said direction control line to said half-duplex communication interface driver to set a transmission direction of said half-duplex communication interface driver to a receiving direction when said data received from said data transmission detector is a signal 1 or a high signal.

8. (Original): The method for switching transmission direction as claimed in claim 7, wherein said half-duplex communication interface driver comprises a driver in compliance with RS485 standard.
9. (Original): The method for switching transmission direction as claimed in claim 7, wherein said transmission direction switching device is a programmable logic device.
10. (Original): A method for switching transmission direction of a half-duplex communication apparatus, said half-duplex communication apparatus including a universal asynchronous receiver transmitter (UART), a half-duplex communication interface driver having a

signal subtraction function, and a transmission direction switching device; said half-duplex communication interface driver being connected to said UART via a sending line and to said transmission direction switching device via a direction control line; and said transmission direction switching device including a data transmission detector and a direction-switching rule executor; said method comprising the steps of:

detecting any data transmission by using said data transmission detector coupled to said sending line to detect any data to be sent and sending said data if such data exists; and

implementing transmission direction switching by using said direction-switching rule executor to

receive said data sent by said data transmission detector and generate a negative data in reverse to said data received from said data transmission detector, such that said direction-switching rule executor sends a direction switching signal via said direction control line to said half-duplex communication interface driver to set a transmission direction of said half-duplex communication interface driver to a sending direction when said negative data is a signal 0 or a low signal, or sends a direction switching signal via said direction control line to said half-duplex communication interface driver to set a transmission direction of said half-duplex communication interface driver to a receiving direction when said negative data is a signal 1 or a high signal.

11. (Original): The method for switching transmission direction as claimed in claim 10, wherein said half-duplex communication interface driver comprises a driver in compliance with RS485 standard
12. (Original): The method for switching transmission direction as claimed in claim 10, wherein said transmission direction switching device is a programmable logic device.